EKSAKTA Vol. 11 No.2, Agustus 2010, 79-85

Redox Reaction in the Cyclization-aromatization of *(R)*-(+)-Citronellal with $FeCl_3$/Acetic Anhydride

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ABSTRACT

The effects of temperature, time of reaction, and the reactants mole ratio on the cyclization-acetylation of (R)-(+)-citronellal with $FeCl_3$/acetic anhydride were studied. Isopulegyl acetate (IPA) and neoisopulegyl acetate (NIPA) were obtained as the main products at room temperature (mole ratio of citronellal: acetic anhydride: $FeCl_3$ = 6:12:1). Both products are relatively fixed after the 30th minute. The average concentration of IPA at 30-180 minutes was 44.71%, while the average concentration of NIPA was 28.47%. Increasing temperature (80 ^oC) and the amount of acetic anhydride (mol ratio 2:6:1) gave *p*-cymene (17.53%) and citronellyl acetate (11.31%). Autoredoks reaction on the transformation of citronellal into *p*-cymene and citronellyl acetate was studied with the carbon oxidation number concept.

Key words: (R)-(+)- citronellal, cyclization-aromatization, $FeCl_3$, *p*-cymene, redox